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SEQUENCE LISTING

TECH CENTER 1600/2900

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<120> Method of Inducing and/or Enhancing an Immune Response  
to Tumor Antigens

<130> 11014-15

<140> 09/693,754

<141> 2000-10-20

<150> 60/223,325

<151> 2000-08-07

<150> 60/160,879

<151> 1999-10-22

<160> 113

<170> PatentIn Ver. 2.0

<210> 1

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp 100 peptide

<400> 1

Ile Met Asp Gln Val Pro Phe Ser Tyr

1

5

<210> 2

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp 100 peptide

<400> 2

Tyr Leu Glu Pro Gly Pro Val Thr Val

1

5

<210> 3

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp 100 peptide

<400> 3

His Leu Ala Val Ile Gly Ala Leu Leu Ala Val Gly Ala Thr Lys

1

5

10

15

<210> 4

<211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 4  
 Gly Ala Leu Leu Ala Val Gly Ala Thr Lys Val Pro Arg Asn Gln  
       1                  5                  10                  15

<210> 5  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 5  
 Val Gly Ala Thr Lys Val Pro Arg Asn Gln Asp Trp Leu Gly Val  
       1                  5                  10                  15

<210> 6  
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 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 6  
 Val Pro Arg Asn Gln Asp Trp Leu Gly Val Ser Arg Gln Leu Arg  
       1                  5                  10                  15

<210> 7  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 7  
 Asp Trp Leu Gly Val Ser Arg Gln Leu Arg Thr Lys Ala Trp Asn  
       1                  5                  10                  15

<210> 8  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 8  
 Ser Arg Gln Leu Arg Thr Lys Ala Trp Asn Arg Gln Leu Tyr Pro  
       1                  5                  10                  15

<210> 9

<211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 9  
 Thr Lys Ala Trp Asn Arg Gln Leu Tyr Pro Glu Trp Thr Glu Ala  
           1                  5                  10                  15

<210> 10  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 10  
 Arg Gln Leu Tyr Pro Glu Trp Thr Glu Ala Gln Arg Leu Asp Cys  
           1                  5                  10                  15

<210> 11  
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 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 11  
 Glu Trp Thr Glu Ala Gln Arg Leu Asp Cys Trp Arg Gly Gly Gln  
           1                  5                  10                  15

<210> 12  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 12  
 Gln Arg Leu Asp Cys Trp Arg Gly Gly Gln Val Ser Leu Lys Val  
           1                  5                  10                  15

<210> 13  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 13  
 Trp Arg Gly Gly Gln Val Ser Leu Lys Val Ser Asn Asp Gly Pro  
           1                  5                  10                  15

<210> 14

<211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 14  
 Val Ser Leu Lys Val Ser Asn Asp Gly Pro Thr Leu Ile Gly Ala  
     1                    5                    10                    15

<210> 15  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 15  
 Ile Ala Leu Asn Phe Pro Gly Ser Gln Lys Val Leu Pro Asp Gly  
     1                    5                    10                    15

<210> 16  
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 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 16  
 Pro Gly Ser Gln Lys Val Leu Pro Asp Gly Gln Val Ile Trp Val  
     1                    5                    10                    15

<210> 17  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 17  
 Val Leu Pro Asp Gly Gln Val Ile Trp Val Asn Asn Thr Ile Ile  
     1                    5                    10                    15

<210> 18  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 18  
 Gln Val Ile Trp Val Asn Asn Thr Ile Ile Asn Gly Ser Gln Val  
     1                    5                    10                    15

<210> 19

<211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 19  
 Asn Asn Thr Ile Ile Asn Gly Ser Gln Val Trp Gly Gly Gln Pro  
     1                    5                    10                    15

<210> 20  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 20  
 Asn Gly Ser Gln Val Trp Gly Gly Gln Pro Val Tyr Pro Gln Glu  
     1                    5                    10                    15

<210> 21  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 21  
 Trp Gly Gly Gln Pro Val Tyr Pro Gln Glu Thr Asp Asp Ala Cys  
     1                    5                    10                    15

<210> 22  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 22  
 Val Tyr Pro Gln Glu Thr Asp Asp Ala Cys Ile Phe Pro Asp Gly  
     1                    5                    10                    15

<210> 23  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 23  
 Thr Asp Asp Ala Cys Ile Phe Pro Asp Gly Gly Pro Cys Pro Ser  
     1                    5                    10                    15

<210> 24  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 24  
 Ile Phe Pro Asp Gly Gly Pro Cys Pro Ser Gly Ser Trp Ser Gln  
       1                  5                  10                  15

<210> 25  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 25  
 Gly Ser Trp Ser Gln Lys Arg Ser Phe Val Tyr Val Trp Lys Thr  
       1                  5                  10                  15

<210> 26  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 26  
 Lys Arg Ser Phe Val Tyr Val Trp Lys Thr Trp Gly Gln Tyr Trp  
       1                  5                  10                  15

<210> 27  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 27  
 Tyr Val Trp Lys Thr Trp Gly Gln Tyr Trp Gln Val Leu Gly Gly  
       1                  5                  10                  15

<210> 28  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 28  
 Trp Gly Gln Tyr Trp Gln Val Leu Gly Gly Pro Val Ser Gly Leu  
       1                  5                  10                  15

<210> 29  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 29  
 Gln Val Leu Gly Gly Pro Val Ser Gly Leu Ser Ile Gly Thr Gly  
           1                          5                          10                          15

<210> 30  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 30  
 Pro Val Ser Gly Leu Ser Ile Gly Thr Gly Arg Ala Met Leu Gly  
           1                          5                          10                          15

<210> 31  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 31  
 Ser Ile Gly Thr Gly Arg Ala Met Leu Gly Thr His Thr Met Glu  
           1                          5                          10                          15

<210> 32  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 32  
 Arg Ala Met Leu Gly Thr His Thr Met Glu Val Thr Val Tyr His  
           1                          5                          10                          15

<210> 33  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 33  
 Thr His Thr Met Glu Val Thr Val Tyr His Arg Arg Gly Ser Arg  
           1                          5                          10                          15

<210> 34  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 34  
 Val Thr Val Tyr His Arg Arg Gly Ser Arg Ser Tyr Val Pro Leu  
     1                    5                    10                    15

<210> 35  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 35  
 Arg Arg Gly Ser Arg Ser Tyr Val Pro Leu Ala His Ser Ser Ser  
     1                    5                    10                    15

<210> 36  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 36  
 Ser Tyr Val Pro Leu Ala His Ser Ser Ser Ala Phe Thr Ile Thr  
     1                    5                    10                    15

<210> 37  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 37  
 Ala Phe Thr Ile Thr Asp Gln Val Pro Phe Ser Val Ser Val Ser  
     1                    5                    10                    15

<210> 38  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 38  
 Asp Gln Val Pro Phe Ser Val Ser Val Ser Gln Leu Arg Ala Leu  
     1                    5                    10                    15

<210> 39  
 <211> 15



<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 39  
 Ser Val Ser Val Ser Gln Leu Arg Ala Leu Asp Gly Gly Asn Lys  
           1                  5                  10                  15

<210> 40  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 40  
 Asp Gly Gly Asn Lys His Phe Leu Arg Asn Gln Pro Leu Thr Phe  
           1                  5                  10                  15

<210> 41  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 41  
 His Phe Leu Arg Asn Gln Pro Leu Thr Phe Ala Leu Gln Leu His  
           1                  5                  10                  15

<210> 42  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 42  
 Gln Pro Leu Thr Phe Ala Leu Gln Leu His Asp Pro Ser Gly Tyr  
           1                  5                  10                  15

<210> 43  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 43  
 Ala Leu Gln Leu His Asp Pro Ser Gly Tyr Leu Ala Glu Ala Asp  
           1                  5                  10                  15

<210> 44  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 44  
 Asp Phe Gly Asp Ser Ser Gly Thr Leu Ile Ser Arg Ala Leu Val  
           1                  5                  10                  15

<210> 45  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 45  
 Ser Thr Gly Leu Ile Ser Arg Ala Leu Val Val Thr His Thr Tyr  
           1                  5                  10                  15

<210> 46  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 46  
 Ser Arg Ala Leu Val Val Thr His Thr Tyr Leu Glu Pro Gly Pro  
           1                  5                  10                  15

<210> 47  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 47  
 Val Thr His Thr Tyr Leu Glu Pro Gly Pro Val Thr Ala Gln Val  
           1                  5                  10                  15

<210> 48  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 48  
 Leu Glu Pro Gly Pro Val Thr Ala Gln Val Val Leu Gln Ala Ala  
           1                  5                  10                  15

<210> 49  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 49  
 Val Thr Ala Gln Val Val Leu Gln Ala Ala Ile Pro Leu Thr Ser  
           1                  5                  10                  15

<210> 50  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 50  
 Val Leu Gln Ala Ala Ile Pro Leu Thr Ser Cys Gly Ser Ser Pro  
           1                  5                  10                  15

<210> 51  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 51  
 Ile Pro Leu Thr Ser Cys Gly Ser Ser Pro Val Pro Gly Thr Thr  
           1                  5                  10                  15

<210> 52  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 52  
 Val Pro Gly Thr Thr Asp Gly His Arg Pro Thr Ala Glu Ala Pro  
           1                  5                  10                  15

<210> 53  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 53  
 Asp Gly His Arg Pro Thr Ala Glu Ala Pro Asn Thr Thr Ala Gly  
           1                  5                  10                  15

<210> 54  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 54  
 Thr Ala Glu Ala Pro Asn Thr Thr Ala Gly Gln Val Pro Thr Thr  
           1                          5                          10                          15

<210> 55  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 55  
 Gln Val Pro Thr Thr Glu Val Val Gly Thr Thr Pro Gly Gln Ala  
           1                          5                          10                          15

<210> 56  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 56  
 Glu Val Val Gly Thr Thr Pro Gly Gln Ala Pro Thr Ala Glu Pro  
           1                          5                          10                          15

<210> 57  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 57  
 Thr Pro Gly Gln Ala Pro Thr Ala Glu Pro Ser Gly Thr Thr Ser  
           1                          5                          10                          15

<210> 58  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 58  
 Pro Thr Ala Glu Pro Ser Gly Thr Thr Ser Val Gln Val Pro Thr  
           1                          5                          10                          15

<210> 59  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 59  
 Ser Gly Thr Thr Ser Val Gln Val Pro Thr Thr Glu Val Ile Ser  
           1                          5                          10                          15

<210> 60  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 60  
 Val Gln Val Pro Thr Thr Glu Val Ile Ser Thr Ala Pro Val Gln  
           1                          5                          10                          15

<210> 61  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 61  
 Thr Glu Val Ile Ser Thr Ala Pro Val Gln Met Pro Thr Ala Glu  
           1                          5                          10                          15

<210> 62  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 62  
 Thr Ala Pro Val Gln Met Pro Thr Ala Glu Ser Thr Gly Met Thr  
           1                          5                          10                          15

<210> 63  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 63  
 Met Pro Thr Ala Glu Ser Thr Gly Met Thr Pro Glu Lys Val Pro  
           1                          5                          10                          15

<210> 64  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 64  
 Ser Thr Gly Met Thr Pro Glu Lys Val Pro Val Ser Glu Val Met  
           1                          5                          10                          15

<210> 65  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 65  
 Pro Glu Lys Val Pro Val Ser Glu Val Met Gly Thr Thr Leu Ala  
           1                          5                          10                          15

<210> 66  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 66  
 Val Ser Glu Val Met Gly Thr Thr Leu Ala Glu Met Ser Thr Pro  
           1                          5                          10                          15

<210> 67  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 67  
 Gly Thr Thr Leu Ala Glu Met Ser Thr Pro Glu Ala Thr Gly Met  
           1                          5                          10                          15

<210> 68  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 68  
 Glu Met Ser Thr Pro Glu Ala Thr Gly Met Thr Pro Ala Glu Val  
           1                          5                          10                          15

<210> 69  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 69  
 Ser Ile Val Val Leu Ser Gly Thr Thr Ala Ala Gln Val Thr Thr  
           1                          5                          10                          15

<210> 70  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 70  
 Ser Gly Thr Thr Ala Ala Gln Val Thr Thr Thr Glu Trp Val Glu  
           1                          5                          10                          15

<210> 71  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 71  
 Ala Gln Val Thr Thr Thr Glu Trp Val Glu Thr Thr Ala Arg Glu  
           1                          5                          10                          15

<210> 72  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 72  
 Thr Glu Trp Val Glu Thr Thr Ala Arg Glu Leu Pro Ile Pro Glu  
           1                          5                          10                          15

<210> 73  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 73  
 Thr Thr Ala Arg Glu Leu Pro Ile Pro Glu Pro Glu Gly Pro Asp  
           1                          5                          10                          15

<210> 74  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 74  
 Leu Pro Ile Pro Glu Pro Glu Gly Pro Asp Ala Ser Ser Ile Met  
           1                  5                  10                  15

<210> 75  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 75  
 Pro Glu Gly Pro Asp Ala Ser Ser Ile Met Ser Thr Glu Ser Ile  
           1                  5                  10                  15

<210> 76  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 76  
 Ala Ser Ser Ile Met Ser Thr Glu Ser Ile Thr Gly Ser Leu Gly  
           1                  5                  10                  15

<210> 77  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 77  
 Ser Thr Glu Ser Ile Thr Gly Ser Leu Gly Pro Leu Leu Asp Gly  
           1                  5                  10                  15

<210> 78  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 78  
 Thr Gly Ser Leu Gly Pro Leu Leu Asp Gly Thr Ala Thr Leu Arg  
           1                  5                  10                  15

<210> 79  
 <211> 15



<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 79  
 Pro Leu Leu Asp Gly Thr Ala Thr Leu Arg Leu Val Lys Arg Gln  
           1                  5                  10                  15

<210> 80  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 80  
 Thr Ala Thr Leu Arg Leu Val Lys Arg Gln Val Pro Leu Asp Cys  
           1                  5                  10                  15

<210> 81  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 81  
 Leu Val Lys Arg Gln Val Pro Leu Asp Cys Val Leu Tyr Arg Tyr  
           1                  5                  10                  15

<210> 82  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 82  
 Val Pro Leu Asp Cys Val Leu Tyr Arg Tyr Gly Ser Phe Ser Val  
           1                  5                  10                  15

<210> 83  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 83  
 Val Leu Tyr Arg Tyr Gly Ser Phe Ser Val Thr Leu Asp Ile Val  
           1                  5                  10                  15

<210> 84  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 84  
 Thr Leu Asp Ile Val Gln Gly Ile Glu Ser Ala Glu Ile Leu Gln  
           1                  5                  10                  15

<210> 85  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 85  
 Gln Gly Ile Glu Ser Ala Glu Ile Leu Gln Ala Val Pro Ser Gly  
           1                  5                  10                  15

<210> 86  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 86  
 Ala Glu Ile Leu Gln Ala Val Pro Ser Gly Glu Gly Asp Ala Phe  
           1                  5                  10                  15

<210> 87  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 87  
 Ala Val Pro Ser Gly Glu Gly Asp Ala Phe Glu Leu Thr Val Ser  
           1                  5                  10                  15

<210> 88  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 88  
 Glu Gly Asp Ala Phe Glu Leu Thr Val Ser Cys Gln Gly Gly Leu  
           1                  5                  10                  15

<210> 89  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 89  
 Glu Leu Thr Val Ser Cys Gln Gly Gly Leu Pro Lys Glu Ala Cys  
           1                  5                  10                  15

<210> 90  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 90  
 Cys Gln Gly Gly Leu Pro Lys Glu Ala Cys Met Glu Ile Ser Ser  
           1                  5                  10                  15

<210> 91  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 91  
 Pro Lys Glu Ala Cys Met Glu Ile Ser Ser Pro Gly Cys Gln Pro  
           1                  5                  10                  15

<210> 92  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 92  
 Met Glu Ile Ser Ser Pro Gly Cys Gln Pro Pro Ala Gln Arg Leu  
           1                  5                  10                  15

<210> 93  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 93  
 Pro Ala Gln Arg Leu Cys Gln Pro Val Leu Pro Ser Pro Ala Cys  
           1                  5                  10                  15

<210> 94  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 94  
 Cys Gln Pro Val Leu Pro Ser Pro Ala Cys Gln Leu Val Leu His  
     1                    5                    10                    15

<210> 95  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 95  
 Pro Ser Pro Ala Cys Gln Leu Val Leu His Gln Ile Leu Lys Gly  
     1                    5                    10                    15

<210> 96  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 96  
 Gln Leu Val Leu His Gln Ile Leu Lys Gly Gly Ser Gly Thr Tyr  
     1                    5                    10                    15

<210> 97  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 97  
 Leu Ala Asp Thr Asn Ser Leu Ala Val Val Ser Thr Gln Leu Ile  
     1                    5                    10                    15

<210> 98  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 98  
 Ser Leu Ala Val Val Ser Thr Gln Leu Ile Met Pro Gly Gln Glu  
     1                    5                    10                    15

<210> 99  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 99  
 Ser Thr Gln Leu Ile Met Pro Gly Gln Glu Ala Gly Leu Gly Gln  
           1                  5                  10                  15

<210> 100  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 100  
 Met Pro Gly Gln Glu Ala Gly Leu Gly Gln Val Pro Leu Ile Val  
           1                  5                  10                  15

<210> 101  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 101  
 Ala Gly Leu Gly Gln Val Pro Leu Ile Val Gly Ile Leu Leu Val  
           1                  5                  10                  15

<210> 102  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 102  
 Leu Met Ala Val Val Leu Ala Ser Leu Ile Tyr Arg Arg Arg Leu  
           1                  5                  10                  15

<210> 103  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 103  
 Tyr Arg Arg Arg Leu Met Lys Gln Asp Phe Ser Val Pro Gln Leu  
           1                  5                  10                  15

<210> 104  
 <211> 15

<212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 104  
 Met Lys Gln Asp Phe Ser Val Pro Gln Leu Pro His Ser Ser Ser  
           1                          5                          10                          15

<210> 105  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 105  
 Ser Val Pro Gln Leu Pro His Ser Ser Ser His Trp Leu Arg Leu  
           1                          5                          10                          15

<210> 106  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 106  
 Pro His Ser Ser Ser His Trp Leu Arg Leu Pro Arg Ile Phe Cys  
           1                          5                          10                          15

<210> 107  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 107  
 His Trp Leu Arg Leu Pro Arg Ile Phe Cys Ser Cys Pro Ile Gly  
           1                          5                          10                          15

<210> 108  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp 100 peptide

<400> 108  
 Pro Arg Ile Phe Cys Ser Cys Pro Ile Gly Glu Asn Ser Pro Leu  
           1                          5                          10                          15

<210> 109  
 <211> 1986

<212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:modified gp100

<220>  
 <221> CDS  
 <222> (1)..(1983)

<400> 109  
 atg gat ctg gtg cta aaa aga tgc ctt ctt cat ttg gct gtg ata ggt 48  
 Met Asp Leu Val Leu Lys Arg Cys Leu Leu His Leu Ala Val Ile Gly  
 1 5 10 15

gct ttg ctg gct gtg ggg gct aca aaa gta ccc aga aac cag gac tgg 96  
 Ala Leu Leu Ala Val Gly Ala Thr Lys Val Pro Arg Asn Gln Asp Trp  
 20 25 30

ctt ggt gtc tca agg caa ctc aga acc aaa gcc tgg aac agg cag ctg 144  
 Leu Gly Val Ser Arg Gln Leu Arg Thr Lys Ala Trp Asn Arg Gln Leu  
 35 40 45

tat cca gag tgg aca gaa gcc cag aga ctt gac tgc tgg aga ggt ggt 192  
 Tyr Pro Glu Trp Thr Glu Ala Gln Arg Leu Asp Cys Trp Arg Gly Gly  
 50 55 60

caa gtg tcc ctc aag gtc agt aat gat ggg cct aca ctg att ggt gca 240  
 Gln Val Ser Leu Lys Val Ser Asn Asp Gly Pro Thr Leu Ile Gly Ala  
 65 70 75 80

aat gcc tcc ttc tct att gcc ttg aac ttc cct gga agc caa aag gta 288  
 Asn Ala Ser Phe Ser Ile Ala Leu Asn Phe Pro Gly Ser Gln Lys Val  
 85 90 95

ttg cca gat ggg cag gtt atc tgg gtc aac aat acc atc atc aat ggg 336  
 Leu Pro Asp Gly Gln Val Ile Trp Val Asn Asn Thr Ile Ile Asn Gly  
 100 105 110

agc cag gtg tgg gga gga cag cca gtg tat ccc cag gaa act gac gat 384  
 Ser Gln Val Trp Gly Gly Gln Pro Val Tyr Pro Gln Glu Thr Asp Asp  
 115 120 125

gcc tgc atc ttc cct gat ggt gga cct tgc cca tct ggc tct tgg tct 432  
 Ala Cys Ile Phe Pro Asp Gly Gly Pro Cys Pro Ser Gly Ser Trp Ser  
 130 135 140

cag aag aga agc ttt gtt tat gtc tgg aag acc tgg ggc caa tac tgg 480  
 Gln Lys Arg Ser Phe Val Tyr Val Trp Lys Thr Trp Gly Gln Tyr Trp  
 145 150 155 160

caa gtt cta ggg ggc cca gtg tct ggg ctg agc att ggg aca ggc agg 528  
 Gln Val Leu Gly Gly Pro Val Ser Gly Leu Ser Ile Gly Thr Gly Arg  
 165 170 175

gca atg ctg ggc aca cac acg atg gaa gtg act gtc tac cat cgc cgg 576  
 Ala Met Leu Gly Thr His Thr Met Glu Val Thr Val Tyr His Arg Arg  
 180 185 190

gga tcc cgg agc tat gtg cct ctt gct cat tcc agc tca gcc ttc acc 624  
 Gly Ser Arg Ser Tyr Val Pro Leu Ala His Ser Ser Ser Ala Phe Thr  
 195 200 205

att atg gac cag gtg cct ttc tcc gtg agc gtg tcc cag ttg cgg gcc 672  
 Ile Met Asp Gln Val Pro Phe Ser Val Ser Val Ser Gln Leu Arg Ala

210	215	220	
ttg gat gga ggg aac aag cac ttc ctg aga aat cag cct ctg acc ttt Leu Asp Gly Gly Asn Lys His Phe Leu Arg Asn Gln Pro Leu Thr Phe 225 230 235 240			720
gcc ctc cag ctc cat gac ccc agt ggc tat ctg gct gaa gct gac ctc Ala Leu Gln Leu His Asp Pro Ser Gly Tyr Leu Ala Glu Ala Asp Leu 245 250 255			768
tcc tac acc tgg gac ttt gga gac agt agt gga acc ctg atc tct cgg Ser Tyr Thr Trp Asp Phe Gly Asp Ser Ser Gly Thr Leu Ile Ser Arg 260 265 270			816
gca ctt gtg gtc act cat act tac ctg gag cct ggc cca gtc act gtt Ala Leu Val Val Thr His Thr Tyr Leu Glu Pro Gly Pro Val Thr Val 275 280 285			864
cag gtg gtc ctg cag gct gcc att cct ctc acc tcc tgt ggc tcc tcc Gln Val Val Leu Gln Ala Ala Ile Pro Leu Thr Ser Cys Gly Ser Ser 290 295 300			912
cca gtt cca ggc acc aca gat ggg cac agg cca act gca gag gcc cct Pro Val Pro Gly Thr Thr Asp Gly His Arg Pro Thr Ala Glu Ala Pro 305 310 315 320			960
aac acc aca gct ggc caa gtg cct act aca gaa gtt gtg ggt act aca Asn Thr Thr Ala Gly Gln Val Pro Thr Thr Glu Val Val Gly Thr Thr 325 330 335			1008
cct ggt cag gcg cca act gca gag ccc tct gga acc aca tct gtg cag Pro Gly Gln Ala Pro Thr Ala Glu Pro Ser Gly Thr Thr Ser Val Gln 340 345 350			1056
gtg cca acc act gaa gtc ata agc act gca cct gtg cag atg cca act Val Pro Thr Thr Glu Val Ile Ser Thr Ala Pro Val Gln Met Pro Thr 355 360 365			1104
gca gag agc aca ggt atg aca cct gag aag gtg cca gtt tca gag gtc Ala Glu Ser Thr Gly Met Thr Pro Glu Lys Val Pro Val Ser Glu Val 370 375 380			1152
atg ggt acc aca ctg gca gag atg tca act cca gag gct aca ggt atg Met Gly Thr Thr Leu Ala Glu Met Ser Thr Pro Glu Ala Thr Gly Met 385 390 395 400			1200
aca cct gca gag gta tca att gtg gtg ctt tct gga acc aca gct gca Thr Pro Ala Glu Val Ser Ile Val Val Leu Ser Gly Thr Thr Ala Ala 405 410 415			1248
cag gta aca act aca gag tgg gtg gag acc aca gct aga gag cta cct Gln Val Thr Thr Glu Trp Val Glu Thr Thr Ala Arg Glu Leu Pro 420 425 430			1296
atc cct gag cct gaa ggt cca gat gcc agc tca atc atg tct acg gaa Ile Pro Glu Pro Glu Gly Pro Asp Ala Ser Ser Ile Met Ser Thr Glu 435 440 445			1344
agt att aca ggt tcc ctg ggc ccc ctg ctg gat ggt aca gcc acc tta Ser Ile Thr Gly Ser Leu Gly Pro Leu Leu Asp Gly Thr Ala Thr Leu 450 455 460			1392
agg ctg gtg aag aga caa gtc ccc ctg gat tgt gtt ctg tat cga tat Arg Leu Val Lys Arg Gln Val Pro Leu Asp Cys Val Leu Tyr Arg Tyr 465 470 475 480			1440



ggt tcc ttt tcc gtc acc ctg gac att gtc cag ggt att gaa agt gcc 1488  
 Gly Ser Phe Ser Val Thr Leu Asp Ile Val Gln Gly Ile Glu Ser Ala  
 485 490 495  
 gag atc ctg cag gct gtg ccg tcc ggt gag ggg gat gca ttt gag ctg 1536  
 Glu Ile Leu Gln Ala Val Pro Ser Gly Glu Gly Asp Ala Phe Glu Leu  
 500 505 510  
 act gtg tcc tgc caa ggc ggg ctg ccc aag gaa gcc tgc atg gag atc 1584  
 Thr Val Ser Cys Gln Gly Gly Leu Pro Lys Glu Ala Cys Met Glu Ile  
 515 520 525  
 tca tcg cca ggg tgc cag ccc cct gcc cag cgg ctg tgc cag cct gtg 1632  
 Ser Ser Pro Gly Cys Gln Pro Pro Ala Gln Arg Leu Cys Gln Pro Val  
 530 535 540  
 cta ccc agc cca gcc tgc cag ctg gtt ctg cac cag ata ctg aag ggt 1680  
 Leu Pro Ser Pro Ala Cys Gln Leu Val Leu His Gln Ile Leu Lys Gly  
 545 550 555 560  
 ggc tcg ggg aca tac tgc ctc aat gtg tct ctg gct gat acc aac agc 1728  
 Gly Ser Gly Thr Tyr Cys Leu Asn Val Ser Leu Ala Asp Thr Asn Ser  
 565 570 575  
 ctg gca gtg gtc agc acc cag ctt atc atg cct ggt caa gaa gca ggc 1776  
 Leu Ala Val Val Ser Thr Gln Leu Ile Met Pro Gly Gln Glu Ala Gly  
 580 585 590  
 ctt ggg cag gtt ccg ctg atc gtg ggc atc ttg ctg gtg ttg atg gct 1824  
 Leu Gly Gln Val Pro Leu Ile Val Gly Ile Leu Leu Val Leu Met Ala  
 595 600 605  
 gtg gtc ctt gca tct ctg ata tat agg cgc aga ctt atg aag caa gac 1872  
 Val Val Leu Ala Ser Leu Ile Tyr Arg Arg Arg Leu Met Lys Gln Asp  
 610 615 620  
 ttc tcc gta ccc cag ttg cca cat agc agc agt cac tgg ctg cgt cta 1920  
 Phe Ser Val Pro Gln Leu Pro His Ser Ser Ser His Trp Leu Arg Leu  
 625 630 635 640  
 ccc cgc atc ttc tgc tct tgt ccc att ggt gag aac agc ccc ctc ctc 1968  
 Pro Arg Ile Phe Cys Ser Cys Pro Ile Gly Glu Asn Ser Pro Leu Leu  
 645 650 655  
 agt ggg cag cag gtc tga 1986  
 Ser Gly Gln Gln Val  
 660

<210> 110

<211> 661

<212> PRT

<213> Artificial Sequence

<400> 110

Met Asp Leu Val Leu Lys Arg Cys Leu Leu His Leu Ala Val Ile Gly  
 1 5 10 15

Ala Leu Leu Ala Val Gly Ala Thr Lys Val Pro Arg Asn Gln Asp Trp  
 20 25 30

Leu Gly Val Ser Arg Gln Leu Arg Thr Lys Ala Trp Asn Arg Gln Leu  
 35 40 45

Tyr Pro Glu Trp Thr Glu Ala Gln Arg Leu Asp Cys Trp Arg Gly Gly  
 50 55 60  
 Gln Val Ser Leu Lys Val Ser Asn Asp Gly Pro Thr Leu Ile Gly Ala  
 65 70 75 80  
 Asn Ala Ser Phe Ser Ile Ala Leu Asn Phe Pro Gly Ser Gln Lys Val  
 85 90 95  
 Leu Pro Asp Gly Gln Val Ile Trp Val Asn Asn Thr Ile Ile Asn Gly  
 100 105 110  
 Ser Gln Val Trp Gly Gly Gln Pro Val Tyr Pro Gln Glu Thr Asp Asp  
 115 120 125  
 Ala Cys Ile Phe Pro Asp Gly Gly Pro Cys Pro Ser Gly Ser Trp Ser  
 130 135 140  
 Gln Lys Arg Ser Phe Val Tyr Val Trp Lys Thr Trp Gly Gln Tyr Trp  
 145 150 155 160  
 Gln Val Leu Gly Gly Pro Val Ser Gly Leu Ser Ile Gly Thr Gly Arg  
 165 170 175  
 Ala Met Leu Gly Thr His Thr Met Glu Val Thr Val Tyr His Arg Arg  
 180 185 190  
 Gly Ser Arg Ser Tyr Val Pro Leu Ala His Ser Ser Ser Ala Phe Thr  
 195 200 205  
 Ile Met Asp Gln Val Pro Phe Ser Val Ser Val Ser Gln Leu Arg Ala  
 210 215 220  
 Leu Asp Gly Gly Asn Lys His Phe Leu Arg Asn Gln Pro Leu Thr Phe  
 225 230 235 240  
 Ala Leu Gln Leu His Asp Pro Ser Gly Tyr Leu Ala Glu Ala Asp Leu  
 245 250 255  
 Ser Tyr Thr Trp Asp Phe Gly Asp Ser Ser Gly Thr Leu Ile Ser Arg  
 260 265 270  
 Ala Leu Val Val Thr His Thr Tyr Leu Glu Pro Gly Pro Val Thr Val  
 275 280 285  
 Gln Val Val Leu Gln Ala Ala Ile Pro Leu Thr Ser Cys Gly Ser Ser  
 290 295 300  
 Pro Val Pro Gly Thr Thr Asp Gly His Arg Pro Thr Ala Glu Ala Pro  
 305 310 315 320  
 Asn Thr Thr Ala Gly Gln Val Pro Thr Thr Glu Val Val Gly Thr Thr  
 325 330 335  
 Pro Gly Gln Ala Pro Thr Ala Glu Pro Ser Gly Thr Thr Ser Val Gln  
 340 345 350  
 Val Pro Thr Thr Glu Val Ile Ser Thr Ala Pro Val Gln Met Pro Thr  
 355 360 365  
 Ala Glu Ser Thr Gly Met Thr Pro Glu Lys Val Pro Val Ser Glu Val  
 370 375 380  
 Met Gly Thr Thr Leu Ala Glu Met Ser Thr Pro Glu Ala Thr Gly Met  
 385 390 395 400

Thr Pro Ala Glu Val Ser Ile Val Val Leu Ser Gly Thr Thr Ala Ala  
 405 410 415  
 Gln Val Thr Thr Thr Glu Trp Val Glu Thr Thr Ala Arg Glu Leu Pro  
 420 425 430  
 Ile Pro Glu Pro Glu Gly Pro Asp Ala Ser Ser Ile Met Ser Thr Glu  
 435 440 445  
 Ser Ile Thr Gly Ser Leu Gly Pro Leu Leu Asp Gly Thr Ala Thr Leu  
 450 455 460  
 Arg Leu Val Lys Arg Gln Val Pro Leu Asp Cys Val Leu Tyr Arg Tyr  
 465 470 475 480  
 Gly Ser Phe Ser Val Thr Leu Asp Ile Val Gln Gly Ile Glu Ser Ala  
 485 490 495  
 Glu Ile Leu Gln Ala Val Pro Ser Gly Glu Gly Asp Ala Phe Glu Leu  
 500 505 510  
 Thr Val Ser Cys Gln Gly Gly Leu Pro Lys Glu Ala Cys Met Glu Ile  
 515 520 525  
 Ser Ser Pro Gly Cys Gln Pro Pro Ala Gln Arg Leu Cys Gln Pro Val  
 530 535 540  
 Leu Pro Ser Pro Ala Cys Gln Leu Val Leu His Gln Ile Leu Lys Gly  
 545 550 555 560  
 Gly Ser Gly Thr Tyr Cys Leu Asn Val Ser Leu Ala Asp Thr Asn Ser  
 565 570 575  
 Leu Ala Val Val Ser Thr Gln Leu Ile Met Pro Gly Gln Glu Ala Gly  
 580 585 590  
 Leu Gly Gln Val Pro Leu Ile Val Gly Ile Leu Leu Val Leu Met Ala  
 595 600 605  
 Val Val Leu Ala Ser Leu Ile Tyr Arg Arg Arg Leu Met Lys Gln Asp  
 610 615 620  
 Phe Ser Val Pro Gln Leu Pro His Ser Ser Ser His Trp Leu Arg Leu  
 625 630 635 640  
 Pro Arg Ile Phe Cys Ser Cys Pro Ile Gly Glu Asn Ser Pro Leu Leu  
 645 650 655  
 Ser Gly Gln Gln Val  
 660

<210> 111  
 <211> 2106  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <221> CDS  
 <222> (1)..(2106)

<220>  
 <223> Description of Artificial Sequence:modified CEA

<400> 111  
 atg gag tct ccc tcg gcc cct ccc cac aga tgg tgc atc ccc tgg cag 48  
 Met Glu Ser Pro Ser Ala Pro Pro His Arg Trp Cys Ile Pro Trp Gln  
 1 5 10 15

agg ctc ctg ctc aca gcc tca ctt cta acc ttc tgg aac ccg ccc acc 96  
 Arg Leu Leu Leu Thr Ala Ser Leu Leu Thr Phe Trp Asn Pro Pro Thr  
 20 25 30

act gcc aag ctc act att gaa tcc acg ccg ttc aat gtc gca gag ggg 144  
 Thr Ala Lys Leu Thr Ile Glu Ser Thr Pro Phe Asn Val Ala Glu Gly  
 35 40 45

aag gag gtg ctt cta ctt gtc cac aat ctg ccc cag cat ctt ttt ggc 192  
 Lys Glu Val Leu Leu Leu Val His Asn Leu Pro Gln His Leu Phe Gly  
 50 55 60

tac agc tgg tac aaa ggt gaa aga gtg gat ggc aac cgt caa att ata 240  
 Tyr Ser Trp Tyr Lys Gly Glu Arg Val Asp Gly Asn Arg Gln Ile Ile  
 65 70 75 80

gga tat gta ata gga act caa caa gct acc cca ggg ccc gca tac agt 288  
 Gly Tyr Val Ile Gly Thr Gln Gln Ala Thr Pro Gly Pro Ala Tyr Ser  
 85 90 95

ggc cga gag ata ata tac ccc aat gca tcc ctg ctg atc cag aac atc 336  
 Gly Arg Glu Ile Ile Tyr Pro Asn Ala Ser Leu Leu Ile Gln Asn Ile  
 100 105 110

atc cag aat gac aca gga ttc tac acc cta cac gtc ata aag tca gat 384  
 Ile Gln Asn Asp Thr Gly Phe Tyr Thr Leu His Val Ile Lys Ser Asp  
 115 120 125

ctt gtg aat gaa gaa gca act ggc cag ttc cgg gta tac ccg gag ctg 432  
 Leu Val Asn Glu Glu Ala Thr Gly Gln Phe Arg Val Tyr Pro Glu Leu  
 130 135 140

ccc aag ccc tcc atc tcc agc aac aac tcc aaa ccc gtg gag gac aag 480  
 Pro Lys Pro Ser Ile Ser Ser Asn Asn Ser Lys Pro Val Glu Asp Lys  
 145 150 155 160

gat gct gtg gcc ttc acc tgt gaa cct gag act cag gac gca acc tac 528  
 Asp Ala Val Ala Phe Thr Cys Glu Pro Glu Thr Gln Asp Ala Thr Tyr  
 165 170 175

ctg tgg tgg gta aac aat cag agc ctc ccg gtc agt ccc agg ctg cag 576  
 Leu Trp Trp Val Asn Asn Gln Ser Leu Pro Val Ser Pro Arg Leu Gln  
 180 185 190

ctg tcc aat ggc aac agg acc ctc act cta ttc aat gtc aca aga aat 624  
 Leu Ser Asn Gly Asn Arg Thr Leu Thr Leu Phe Asn Val Thr Arg Asn  
 195 200 205

gac aca gca agc tac aaa tgt gaa acc cag aac cca gtg agt gcc agg 672  
 Asp Thr Ala Ser Tyr Lys Cys Glu Thr Gln Asn Pro Val Ser Ala Arg  
 210 215 220

cgc agt gat tca gtc atc ctg aat gtc ctc tat ggc ccg gat gcc ccc 720  
 Arg Ser Asp Ser Val Ile Leu Asn Val Leu Tyr Gly Pro Asp Ala Pro  
 225 230 235 240

acc att tcc cct cta aac aca tct tac aga tca ggg gaa aat ctg aac 768  
 Thr Ile Ser Pro Leu Asn Thr Ser Tyr Arg Ser Gly Glu Asn Leu Asn  
 245 250 255

ctc tcc tgc cac gca gcc tct aac cca cct gca cag tac tct tgg ttt	816
Leu Ser Cys His Ala Ala Ser Asn Pro Pro Ala Gln Tyr Ser Trp Phe	
260 265 270	
gtc aat ggg act ttc cag caa tcc acc caa gag ctc ttt atc ccc aac	864
Val Asn Gly Thr Phe Gln Gln Ser Thr Gln Glu Leu Phe Ile Pro Asn	
275 280 285	
atc act gtg aat aat agt gga tcc tat acg tgc caa gcc cat aac tca	912
Ile Thr Val Asn Asn Ser Gly Ser Tyr Thr Cys Gln Ala His Asn Ser	
290 295 300	
gac act ggc ctc aat agg acc aca gtc acg acg atc aca gtc tat gag	960
Asp Thr Gly Leu Asn Arg Thr Thr Val Thr Thr Ile Thr Val Tyr Glu	
305 310 315 320	
cca ccc aaa ccc ttc atc acc agc aac aac tcc aac ccc gtg gag gat	1008
Pro Pro Lys Pro Phe Ile Thr Ser Asn Asn Ser Asn Pro Val Glu Asp	
325 330 335	
gag gat gct gta gcc tta acc tgt gaa cct gag att cag aac aca acc	1056
Glu Asp Ala Val Ala Leu Thr Cys Glu Pro Glu Ile Gln Asn Thr Thr	
340 345 350	
tac ctg tgg tgg gta aat aat cag agc ctc ccg gtc agt ccc agg ctg	1104
Tyr Leu Trp Trp Val Asn Asn Gln Ser Leu Pro Val Ser Pro Arg Leu	
355 360 365	
cag ctg tcc aat gac aac agg acc ctc act cta ctc agt gtc aca agg	1152
Gln Leu Ser Asn Asp Asn Arg Thr Leu Thr Leu Leu Ser Val Thr Arg	
370 375 380	
aat gat gta gga ccc tat gag tgt gga atc cag aac gaa tta agt gtt	1200
Asn Asp Val Gly Pro Tyr Glu Cys Gly Ile Gln Asn Glu Leu Ser Val	
385 390 395 400	
gac cac agc gac cca gtc atc ctg aat gtc ctc tat ggc cca gac gac	1248
Asp His Ser Asp Pro Val Ile Leu Asn Val Leu Tyr Gly Pro Asp Asp	
405 410 415	
ccc acc att tcc ccc tca tac acc tat tac cgt cca ggg gtg aac ctc	1296
Pro Thr Ile Ser Pro Ser Tyr Thr Tyr Tyr Arg Pro Gly Val Asn Leu	
420 425 430	
agc ctc tcc tgc cat gca gcc tct aac cca cct gca cag tat tct tgg	1344
Ser Leu Ser Cys His Ala Ala Ser Asn Pro Pro Ala Gln Tyr Ser Trp	
435 440 445	
ctg att gat ggg aac atc cag caa cac aca caa gag ctc ttt atc tcc	1392
Leu Ile Asp Gly Asn Ile Gln Gln His Thr Gln Glu Leu Phe Ile Ser	
450 455 460	
aac atc act gag aag aac agc gga ctc tat acc tgc cag gcc aat aac	1440
Asn Ile Thr Glu Lys Asn Ser Gly Leu Tyr Thr Cys Gln Ala Asn Asn	
465 470 475 480	
tca gcc agt ggc cac agc agg act aca gtc aag aca atc aca gtc tct	1488
Ser Ala Ser Gly His Ser Arg Thr Thr Val Lys Thr Ile Thr Val Ser	
485 490 495	
gcg gag ctg ccc aag ccc tcc atc tcc agc aac aac tcc aaa ccc gtg	1536
Ala Glu Leu Pro Lys Pro Ser Ile Ser Ser Asn Asn Ser Lys Pro Val	
500 505 510	
gag gac aag gat gct gtg gcc ttc acc tgt gaa cct gag gct cag aac	1584

Glu Asp Lys Asp Ala Val Ala Phe Thr Cys Glu Pro Glu Ala Gln Asn	
515	520 525
aca acc tac ctg tgg tgg gta aat ggt cag agc ctc cca gtc agt ccc	1632
Thr Thr Tyr Leu Trp Trp Val Asn Gly Gln Ser Leu Pro Val Ser Pro	
530	535 540
agg ctg cag ctg tcc aat ggc aac agg acc ctc act cta ttc aat gtc	1680
Arg Leu Gln Leu Ser Asn Gly Asn Arg Thr Leu Thr Leu Phe Asn Val	
545	550 555 560
aca aga aat gac gca aga gcc tat gta tgt gga atc cag aac tca gtg	1728
Thr Arg Asn Asp Ala Arg Ala Tyr Val Cys Gly Ile Gln Asn Ser Val	
	565 570 575
agt gca aac cgc agt gac cca gtc acc ctg gat gtc ctc tat ggg ccg	1776
Ser Ala Asn Arg Ser Asp Pro Val Thr Leu Asp Val Leu Tyr Gly Pro	
	580 585 590
gac acc ccc atc att tcc ccc cca gac tcg tct tac ctt tcg gga gcg	1824
Asp Thr Pro Ile Ile Ser Pro Pro Asp Ser Ser Tyr Leu Ser Gly Ala	
	595 600 605
gac ctc aac ctc tcc tgc cac tcg gcc tct aac cca tcc ccg cag tat	1872
Asp Leu Asn Leu Ser Cys His Ser Ala Ser Asn Pro Ser Pro Gln Tyr	
	610 615 620
tct tgg cgt atc aat ggg ata ccg cag caa cac aca caa gtt ctc ttt	1920
Ser Trp Arg Ile Asn Gly Ile Pro Gln Gln His Thr Gln Val Leu Phe	
	625 630 635 640
atc gcc aaa atc acg cca aat aat aac ggg acc tat gcc tgt ttt gtc	1968
Ile Ala Lys Ile Thr Pro Asn Asn Asn Gly Thr Tyr Ala Cys Phe Val	
	645 650 655
tct aac ttg gct act ggc cgc aat aat tcc ata gtc aag agc atc aca	2016
Ser Asn Leu Ala Thr Gly Arg Asn Asn Ser Ile Val Lys Ser Ile Thr	
	660 665 670
gtc tct gca tct gga act tct cct ggt ctc tca gct ggg gcc act gtc	2064
Val Ser Ala Ser Gly Thr Ser Pro Gly Leu Ser Ala Gly Ala Thr Val	
	675 680 685
ggc atc atg att gga gtg ctg gtt ggg gtt gct ctg ata tag	2106
Gly Ile Met Ile Gly Val Leu Val Gly Val Ala Leu Ile	
	690 695 700

&lt;210&gt; 112

&lt;211&gt; 701

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;400&gt; 112

Met	Glu	Ser	Pro	Ser	Ala	Pro	Pro	His	Arg	Trp	Cys	Ile	Pro	Trp	Gln
1				5					10					15	

Arg	Leu	Leu	Leu	Thr	Ala	Ser	Leu	Leu	Thr	Phe	Trp	Asn	Pro	Pro	Thr
				20					25					30	

Thr	Ala	Lys	Leu	Thr	Ile	Glu	Ser	Thr	Pro	Phe	Asn	Val	Ala	Glu	Gly
		35					40					45			

Lys	Glu	Val	Leu	Leu	Leu	Val	His	Asn	Leu	Pro	Gln	His	Leu	Phe	Gly
		50				55					60				

Tyr Ser Trp Tyr Lys Gly Glu Arg Val Asp Gly Asn Arg Gln Ile Ile  
 65 70 75 80  
 Gly Tyr Val Ile Gly Thr Gln Gln Ala Thr Pro Gly Pro Ala Tyr Ser  
 85 90 95  
 Gly Arg Glu Ile Ile Tyr Pro Asn Ala Ser Leu Leu Ile Gln Asn Ile  
 100 105 110  
 Ile Gln Asn Asp Thr Gly Phe Tyr Thr Leu His Val Ile Lys Ser Asp  
 115 120 125  
 Leu Val Asn Glu Glu Ala Thr Gly Gln Phe Arg Val Tyr Pro Glu Leu  
 130 135 140  
 Pro Lys Pro Ser Ile Ser Ser Asn Asn Ser Lys Pro Val Glu Asp Lys  
 145 150 155 160  
 Asp Ala Val Ala Phe Thr Cys Glu Pro Glu Thr Gln Asp Ala Thr Tyr  
 165 170 175  
 Leu Trp Trp Val Asn Asn Gln Ser Leu Pro Val Ser Pro Arg Leu Gln  
 180 185 190  
 Leu Ser Asn Gly Asn Arg Thr Leu Thr Leu Phe Asn Val Thr Arg Asn  
 195 200 205  
 Asp Thr Ala Ser Tyr Lys Cys Glu Thr Gln Asn Pro Val Ser Ala Arg  
 210 215 220  
 Arg Ser Asp Ser Val Ile Leu Asn Val Leu Tyr Gly Pro Asp Ala Pro  
 225 230 235 240  
 Thr Ile Ser Pro Leu Asn Thr Ser Tyr Arg Ser Gly Glu Asn Leu Asn  
 245 250 255  
 Leu Ser Cys His Ala Ala Ser Asn Pro Pro Ala Gln Tyr Ser Trp Phe  
 260 265 270  
 Val Asn Gly Thr Phe Gln Gln Ser Thr Gln Glu Leu Phe Ile Pro Asn  
 275 280 285  
 Ile Thr Val Asn Asn Ser Gly Ser Tyr Thr Cys Gln Ala His Asn Ser  
 290 295 300  
 Asp Thr Gly Leu Asn Arg Thr Thr Val Thr Thr Ile Thr Val Tyr Glu  
 305 310 315 320  
 Pro Pro Lys Pro Phe Ile Thr Ser Asn Asn Ser Asn Pro Val Glu Asp  
 325 330 335  
 Glu Asp Ala Val Ala Leu Thr Cys Glu Pro Glu Ile Gln Asn Thr Thr  
 340 345 350  
 Tyr Leu Trp Trp Val Asn Asn Gln Ser Leu Pro Val Ser Pro Arg Leu  
 355 360 365  
 Gln Leu Ser Asn Asp Asn Arg Thr Leu Thr Leu Leu Ser Val Thr Arg  
 370 375 380  
 Asn Asp Val Gly Pro Tyr Glu Cys Gly Ile Gln Asn Glu Leu Ser Val  
 385 390 395 400  
 Asp His Ser Asp Pro Val Ile Leu Asn Val Leu Tyr Gly Pro Asp Asp

<220>  
<223> Description of Artificial Sequence:modified CEA epitope



&lt;400&gt; 113

Tyr Leu Ser Gly Ala Asp Leu Asn Leu  
1 5